

Application No. 09/588,407
GAU 1733
Filed December 10, 2000

AMENDMENT TO CLAIMS

With respect to the above-identified Office Action, please amend the Claims as follows:

Claims 1-11 (Cancelled)

12. (Currently Amended) An apparatus for curing a pre-preg repair material supporting a heat curable resin for in-situ repair of a conduit, comprising:

an elastomeric composite having a first end and a second end, wherein the composite includes a non-ferrous heating element comprising electrically conductive fibers comprised of carbon fibers, graphite fibers, carbon filaments or graphite filaments and disposed within a thermoset resin matrix wherein the electrically conductive fibers are braided or arranged helically;

a first end piece fixedly attached to the first end of the composite and having an air port for communication with a compressed air source, a vacuum port for communication with a vacuum supply source and at least one electrical cable port to convey electric current to the non-ferrous heating element from a power supply source; and

a second end piece fixedly attached to the second end of the composite, wherein the composite, the first end piece, and the second end piece form a generally hollow inflation chamber.

13. (Original) The apparatus of Claim 12 wherein the thermoset resin is selected from the group consisting of fluorocarbon and fluorosilicone.

14. (Previously Presented) The apparatus of Claim 12 wherein the heating element includes a plurality of braided fibers comprising temperature tolerant fiber braids and electrically conductive fiber braids.

15. (Original) The apparatus of Claim 14 wherein the braided fibers interact to define a braid angle measure at +/- 45 degrees.

16. (Original) The apparatus of Claim 14 wherein the electrically conductive fiber braids are carbon filaments.

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Claim 17 (Cancelled)

18. (Previously Presented and Allowed) An apparatus for curing a pre-preg repair material supporting a heat curable resin for in-situ repair of a conduit, comprising:

an elastomeric composite having a first end and a second end, wherein the composite includes a non-ferrous heating element comprised of a plurality of filament wound carbon fibers, filament wound graphite fibers, filament wound carbon filaments or filament wound graphite filaments and disposed within a thermoset resin matrix;

a first end piece fixedly attached to the first end of the composite and having an air port for communication with a compressed air source, a vacuum port for communication with a vacuum supply source and at least one electrical cable port to convey electric current to the non-ferrous heating element from a power supply source; and

a second end piece fixedly attached to the second end of the composite, wherein the composite, the first end piece, and the second end piece form a generally hollow inflation chamber.

19. (Previously Presented and Allowed) The apparatus of Claim 18 wherein the wound fibers interact to define an angle measure at +/- 45 degrees.

20. (Currently Amended) A method for repairing a damaged section of a conduit comprising the steps of:

providing an elastomeric composite having a first and second end, wherein the composite includes a non-ferrous electrically conductive heating element comprising electrically conductive fibers comprising carbon fibers, graphite fibers, carbon filaments or graphite filaments and disposed within a thermoset resin matrix wherein the electrically conductive fibers are braided or arranged helically;

fixedly attaching a first and second end piece respectively to the first and second ends of the composite, wherein the first end piece, the second end piece, and the composite form a heating/inflation module;

removably attaching a pre-preg to an outer surface of the composite, wherein the pre-preg includes a structural fiber matrix supporting a heat curable resin;

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positioning the module with the attached pre-preg into the conduit at a damaged location;

inflating the module to a predetermined internal air pressure to expand the composite and press the pre-preg against an inside surface of the conduit;

curing the resin of the pre-preg by causing an electrical current to flow in the heating element to resistively heat the module to a predetermined temperature; and
deflating the module and removing it from the conduit.

Claim 21 (Cancelled)

22. (Currently Amended) A system for in-situ repair of a conduit, comprising:

an apparatus including an elastomeric composite having a first end and a second end, wherein the composite includes a non-ferrous heating element comprising electrically conductive fibers comprising carbon fibers, graphite fibers, carbon filaments or graphite filaments and disposed within a thermoset resin matrix wherein the electrically conductive fibers are braided or arranged helically;

a first end piece fixedly attached to the first end of the composite and having an air port for communication with a compressed air source, a vacuum port for communication with a vacuum supply source and at least one electrical cable port to convey electric current to the non-ferrous heating element from a power supply source;

a second end piece fixedly attached to the second end of the composite, wherein the composite, the first end piece, and the second end piece form an inflation chamber; and,

a pre-preg removably attached to an outer surface of the composite of the apparatus, the pre-preg including a structural fiber matrix supporting a heat curable resin.

Claims 23-52 (Cancelled)